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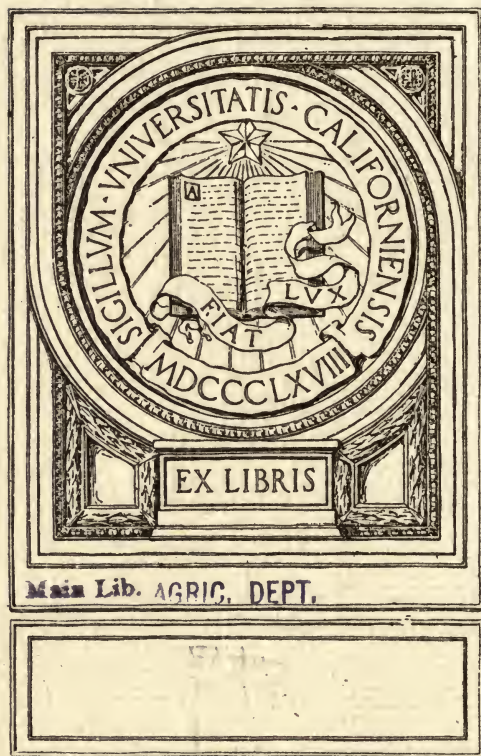
GUIDE TO THE
LITERATURE OF POMOLOGY

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A GUIDE TO THE LITERATURE OF POMOLOGY.

By E. A. BUNYARD, F.L.S., F.R.H.S.

A REVIEW of the literature of pomology within the scope of this paper necessitates certain limitations. Anything in the nature of a detailed survey will obviously be impossible, and the treatment of the subject must therefore be confined to a description of those books which stand out as landmarks in pomological history, either by reason of their originality or by their value as a focus of the knowledge of their time. It is also necessary to fix a starting-point for this survey, and the question, "At what time did pomological literature commence?" is difficult to answer.

The Greek and Roman agricultural writers, to go no further back, wrote much that is of great interest in the history of fruit culture, and indeed it is impossible to appreciate the works of later writers without some knowledge of this literature. Their influence continued for many hundreds of years, and it was long before experiment enabled men to question their magistral authority.

It was not until the Renaissance that a real literature of pomology arose, a literature which was critical and founded upon personal experience. I will therefore take this period, which has the advantage of being conveniently vague, as my starting-point.

The first writer who deserves mention is PIETRO DE CRESCENZI, or CRESCENTIUS, who, though not strictly a pomological author, had a remarkable influence upon the horticulture of his time. Born at Bologna in 1230, he spent much of his life in travel and at an advanced age returned to Italy, where he wrote his "Opus Ruralium Commodorum" at the invitation of CHARLES II., King of Sicily. This work was circulated in manuscript, and after the art of printing had become known in Europe it was printed at many different towns. It is said that a copy of this work was the first product of the presses of Louvain in 1474. Though written in the thirteenth century, it was not until the fifteenth century that its greatest influence was felt, and the numerous editions published all over Europe bear evidence of its great popularity. The chapters dealing with fruit cultivation are of much interest and show evidence of observation, only a few examples of which can be mentioned here. That strong-growing varieties of apples should be pruned in the summer is probably the first mention of summer pruning, and modern investigation is recalled by the advice to keep fresh-planted trees free from weeds until they are well rooted, after which it is not of such great importance. The storing of fruit in a dark place is recommended, and it is interesting to note the definite statement that no apples ripen in June or July.

After CRESCENTII'S the next book of pomological interest is the very scarce work of ANTONINI VENUTI "*De Notensis Agricultura Opusculorum*," which was published at Naples in 1516. Nearly every kind of fruit has a chapter devoted to its cultivation and uses, very largely culled from PALLADIUS and other Roman authors. It is, however, of the greatest interest, as being probably the first book published which deals exclusively with fruits.

About this time France became the leading country in the production of garden literature.

The sixteenth century was a happy period for the industrious compiler, and such men as CHARLES ESTIENNE, brother of the famous printer, prepared many books based on the writings of the ancients, mingled occasionally with original observations. His "*Praedium Rusticum*" was such a work, and deserves notice as the foundation of the more famous "*Maison Rustique*." Nothing of first-rate importance, however, appeared until 1600, when OLIVIER DE SERRES published his remarkable "*Le Théâtre d'Agriculture*," a work which may truly be said to mark the departure from tradition and authority to the wider field of experiment and observation.

DE SERRES possessed in a large degree the "divine curiosity" which was so much a mark of the seventeenth century. At his home at Pradel, near Villeneuve, he founded what was probably the first experimental farm, and after a life spent in questioning Nature he employed his old age in setting down his experiences in garden and farm. His book is written in a charming style, and even nowadays is well worth reading, as its instructions in many garden operations can hardly be improved upon. The success of his book was instantaneous, and at the date of his death in 1619 it had already reached its eighth edition. His life has been written by HENRY VASCHALDE,* and his name is still honoured in France as the Father of French Agriculture. For pomologists his memory is kept alive by the late pear named after him by its raiser, M. BOISBUNEL, of Rouen. The value of the "*Théâtre*" is mainly cultural; some lists of fruits are given, but with few descriptions. We find, however, several fruits which are still grown, such as '*Bon Chrétien d'Hiver*,' '*Caillot Rosat*,' among pears, and '*Court Pendu*,' '*Passe pomme*,' '*Blanc doux*,' '*Châtaignier*,' among apples, all of which may be found in French gardens to-day.

To gain any real idea of the fruits cultivated at this time it is necessary to turn to the remarkable catalogue prepared by LE LECTIER. This industrious man was Procureur Royal at Orléans, and in his leisure moments a keen pomologist. In his garden he collected all the fruits of his time, and they numbered some 260 pears, 35 apples, and 27 peaches. By good fortune a unique copy of this catalogue has been preserved and is now at the Bibliothèque Nationale at Paris. This list of fruits has been reprinted by LEROY in his "*Dictionnaire*

* *Olivier de Serres*, by Henry Vaschalde, Paris, 1886.

de Pomologie," and is most valuable as a witness of the great interest which must have been taken in fruit cultivation at this date.

The closing years of the sixteenth century mark the first appearance of a pomological literature in England. The earliest works were all translations or adaptations of French works. LEONARD MASCALL and BARNABE GOOGE were both translators, and it was not until WILLIAM LAWSON published his "A New Orchard and Garden" that we had a really English work. Authorities are not in agreement as to the date of the first edition, but the dates 1597 and 1615, given by JOHNSON in his "History of Gardening," are probably erroneous. The earliest edition I have seen is in the British Museum, dated 1617. Another edition is dated 1618, and is probably a reprint of the first edition, and the second and third editions are respectively 1623 and 1626. Many other editions followed, and it was reprinted with MARKHAM's "Way to get Wealth" in 1648.

The book is quite original and contains very practical directions for laying down orchards, and it is of great historical importance as the first really English work upon fruit trees.

No work of outstanding merit, from the point of view of this paper, was published in England till the translation of QUINTINYE's great work was undertaken by EVELYN. There are, however, two books which demand notice for the evidence they give of originality and research. The first of these is "The History of the Propagation and Improvement of Vegetables" by ROBERT SHARROCK. The author was born at Adstock, in Buckinghamshire, and took the degree of D.L. at Oxford and afterwards entered the Church. He was led to write his book by his distrust of the fantastic tales of graftings and buddings described in many books of the time, tales which he not unfairly considers worthy of the great Sir JOHN MANDEVILLE. Finding by experiment how impossible it was to graft an apple on a cabbage or an elm, he thought well to describe the methods and limits of this practice. The work is not wholly confined to the propagation of fruits, but it cannot be omitted in the consideration of pomological literature. The first edition is dated 1660 and has 150 pages. The second edition was enlarged to 255 pages and was published in 1672. The additions are general throughout, and do not consist of the adding of fresh chapters. The third edition (1694) was called "An Improvement to the Art of Gardening," but is identical with the second.

Somewhat similar in scope was the work of FRANCIS DROPE, entitled "A Short and Sure Guide in the Practice of Raising and Ordering Fruit Trees," published at Oxford in 1672. A fellow of Magdalen College and a divine by profession, he took "an inoffensive delight" in planting, and this delight is evident on every page of this little book. The fullest directions for raising stocks and grafting trees are given in a style which is full of charm and quaintness. The grafting and budding of trees entirely occupy the writer, and the instructions throughout are of a very sound and practical order.

The next book which had a real influence upon English fruit garden-

ing was EVELYN'S translation of DE LA QUINTINYE'S great classic, but before we consider this it will be well to return to French literature and its progress from the days of DE SERRES.

The seventeenth century marks the separation of horticultural from agricultural literature. With a few exceptions, such as the work of VENUTI above mentioned, nearly all the works published before 1600 were of the "Maison Rustique" type, dealing with all the occupations of the country. After OLIVIER DE SERRES a real gardening literature began to spring up and give ample evidence of the interest which was being felt in the art. It was the age of formalism, and in the "Théâtre des Plans et Jardinages" of CLAUDE MOLLET (1652) we see the beginning of the style which was developed by LE NÔTRE in later years, and which still remains the dominant influence in French gardens. The influence of such formalism was not without its effect in the fruit garden, and it was at this time that the espalier method of training came into great vogue. The author usually quoted as the first to deal with this form of training is JACQUES BOYCEAU, author of "Traité de Jardinage selon les raisons de la Nature et de l'Art." This is, however, a mistake, as OLIVIER DE SERRES devotes a whole chapter to this subject, and speaks of it as an ancient practice, and its existence in the fifteenth century can be proved. There is no doubt, however, that at this time fruit trees were subjected to the most severe pruning in the rage for formal shapes, and they were often trimmed into the devices now associated with the yew and box.

But it was not long before a voice was raised against this unnatural practice, and the importance of this movement in fruit culture makes it necessary to give some prominence to LE GENDRE, whose little work, "La Manière de Cultiver les Arbres Fruitières," was published at Paris in 1652. Much has been written on the subject of the authorship of this work. Some authorities consider the name of LE GENDRE to be a pseudonym. Others allow LE GENDRE the credit of writing rough notes which were worked up by others. Against these suggestions there are certain facts. That such a person as LE GENDRE did exist is undoubted, and it is on record that he was born at Vaudreuil, in Evreux, in 1612. He occupied the joint post of almoner and superintendent of the Royal Gardens under LOUIS XIII. His cure was at Henonville, in Normandy, and there he gathered together a collection of rare fruits, flowers, and animals. That he was a man of education seems evident from his friendship with CORNEILLE, and this great poet has left verses commemorating the charm of the pastoral garden and its owner, one verse of which may be quoted here:—

"Des arbres si beaux, l'épaisse chevelure
Conserve la fraîcheur d'une molle verdure,
Où divers animaux que je ne connais pas
Trouvent à se cacher et prendre leurs ébats."

CORNEILLE, however, discloses himself as no gardener, for the "épaisse chevelure" was the very thing that LE GENDRE set out to combat. It is his special merit that he realized that the pruning of

fruit trees must aim at a natural and not an artificial form. The "chevelure" system of pruning with shears receives his special condemnation, and he will have only the knife. Furthermore, he realized that different varieties, by their natural habit, demand different treatment in pruning.

This little book can hardly be valued too highly. Greatly superior to many works of numerous editions, it bears the imprint of the worker and observer, and conveys to the reader the real love of gardening more than any fruit book I can recall. His final counsels are admirable. "It would be useless to have examined with so much care the nature of fruit trees, to have given so many instructions for their right culture, if I did not finish by advice which I esteem the principal and most important of all: that one cannot have beautiful trees without loving them. Neither goodness of soil, nor rich manure, nor favourable situations will alone make them thrive, but it is the gardener's affection which makes them strong and vigorous."

A work which had a great popularity at this time was "*Le Jardinier François*." The author, NICHOLAS DE BONNEFONDS, was, it is said, *valet de chambre* to the French King, but little more is known of him. The first edition of his work was published in Paris in 1651, and contains some very interesting early copper plates. The work covers all the operations of the fruit garden, and includes some interesting lists of fruits. Several editions rapidly followed, and in 1658 it was translated into English as "*The French Gardener, Instructing how to Cultivate all sorts of Fruit Trees and Herbs for the Garden*." The translation was stated in the first edition to be by "Philokepos," but EVELYN'S name appeared in the second. Bound with this is generally found "*Les Délices de la Campagne*," which follows the fruits into the kitchen and deals with their treatment there.

But the day for such homely works as these was passing, and the literature of fruit culture was coming to a stage when copious and magnificent volumes were published, works fully in keeping with the age whose King "had enough in him to make four kings and one honest man." Happily some part of this multiple personality was devoted to the development of the garden, and the final result, Versailles, has had a deep and lasting effect upon horticulture.

Almost equal in fame to the great LE NÔTRE in the formal garden was LA QUINTINYE in the "potager." Under his auspices this domestic quarter of the garden reached an importance hitherto unknown.

LA QUINTINYE was born in Angoumois in 1626, and died in 1688. He studied at first for a legal career, but a journey to Italy turned his thoughts to gardening, and he was called on his return by LOUIS XIV. to create the fruit and vegetable gardens at Chantilly, Rambouillet, and Versailles. For the royal table at Versailles every kind of fruit was wanted in perfection, and QUINTINYE supplied this both in and out of season, as forcing of fruits, vegetables, and flowers was largely carried on. His great work "*Instruction pour les Jardins potagers*

et fruitiers" was published in 1690, two years after his death, and was the most detailed work at that time upon fruit trees and their culture. Every aspect was treated with great minuteness, and in fact some five hundred pages are occupied with fruits. Cultural information occupies the greater part of the work, and there are a few points upon which he shows evidence of originality. His disregard of the influence of the moon, so long an important factor in all garden operations, was remarkable; but a zealous and conservative editor, fearing that this innovation might not be well received, added a chapter which reinstated the moon to its hegemonic position. In the pruning of the roots when transplanting, QUINTINYE anticipated the moderns by insisting that all fibres and roots smaller than a quill are valueless and should be entirely removed, as new fibres must be produced before the plant could absorb water from the soil.

The descriptions of fruits given are not very full, but more so than those given by his predecessors, and a new feature was added by the very full notes of the cultural needs and special preferences of the various fruits. Another useful item is a definition of various gardening terms. In pruning QUINTINYE was a firm believer in the maxim, "First make your tree, then fruit it"; and his counsel, "*Retarder vos jouissances pour en jouir plus longtemps*," was applied both to pruning and in his strong recommendation as to the need of thinning fruit. This latter point was probably somewhat new in his day.

The fame of QUINTINYE and his work at Versailles was soon spread far, and he visited England, where he met JOHN EVELYN, who later translated his book. It is not difficult to imagine the enthusiasm with which EVELYN would have welcomed the great French gardener, and the "*Treatise on the Culture of Melons*" which is added to the English translation was written at EVELYN's request. The success of the work was great; many French editions have been published, and it was also translated into Italian and Dutch.

EVELYN's translation was published in 1693 and entitled "*The Compleat Gard'ner, or directions for cultivating and right ordering of Fruit Gardens and Kitchen Gardens, with divers Reflections on several parts of Husbandry*" (folio, London, 1693). It is a complete and literal translation. The great length of the work and the tedious repetition of some parts made an abridgment obviously desirable. This was provided by the famous nurserymen LONDON and WISE, but was probably EVELYN's own work, and was entitled "*The Complete Gardener, or Directions for Cultivating and right Ordering of Fruit Gardens and Kitchen Gardens. Now compendiously abridged and made of more use, with very considerable improvements, by George London and Henry Wise.*" (London, 1699.)

This work had an instant success and passed through many editions with great rapidity, the seventh being dated 1719. It was through this work that the precepts of QUINTINYE became generally known in this country, and their influence was very great for many years.

The opening years of the eighteenth century in England were

remarkable for an output of books on fruit trees, and there are many names from which it is difficult to select the most prominent. The dependence upon French authors had now ceased, a native literature was in full swing, and a certain revulsion from French influences may be noted.

The first author who claims notice is the Rev. JOHN LAURENCE, who was born at St. Martin's, Stamford Baron, Northamptonshire, where his father was incumbent. After taking his degree at Cambridge he was presented with the living of Yelvertoft, Northampton. Subsequently he was appointed vicar of Bishopwearmouth, Durham, and finally he was a prebendary of Salisbury. These changes gave him a wider experience of soils and climates than falls to the lot of many writers, and he made full use of this experience in his books. His first publication was "The Clergy-man's Recreation, Shewing the Pleasure and Profit of the Art of Gardening," an octavo published at London in 1714. This passed rapidly into many editions, and was followed by "The Gentleman's Recreation," London, 1716; "The Fruit Garden Kalendar," London, 1718; and "The Art of Gardening Improved," London, 1718; this last being a combination of previous works. A work called "A New System of Agriculture" (folio, London, 1727) contains some very useful chapters on fruit culture, and is of interest as presenting his matured opinions.

LAURENCE was no mere theorist, and many of his practices were decidedly original. He was a great advocate of the bush system of cultivation, and his recommendations on planting are interesting. In planting a young tree all the roots were to be cut back to 6 inches and all fibres removed. Three main roots were considered sufficient. In planting no hole was dug; the root was just pressed into the soil and then covered with a fine mould. This method was said to prevent the production of coarse roots and to be very successful. His remarks on diseases are very interesting, and he says: "Had I but elbow-room, I have a great inclination to turn Quack in Vegetables." His counsels to nurserymen of the day were very sound, and doubtless much needed if we may judge by a letter sent to a disappointed purchaser by a "merry fellow" whose trees had not turned out all that might have been expected. It is impossible to refrain from quoting this ingenious epistle:

"It is true you gentlemen charge us (and often very justly) with sending you down bad trees and wrong sorts; but though you may think us Knaves, you must not say we are Fools, for we have three *hits* for it. First, if the trees I send you down be a wrong sort or on a bad stock, the tree may die before it comes to bear, and then the fault is laid on the planter or other accidents and outward injuries, and so I hear no more of that, but another is sent for in its room, perhaps the same kind. Secondly, the Gentleman who sends for the tree may chance to die before it wins to bear, and then the next heir blames the choice and sends for another. Or, lastly, I die myself, and then the Proverb takes place, *De mortuis nil nisi bonum*!"

The works of LAURENCE had a great popularity, but they were overshadowed by the excellent book of STEPHEN SWITZER, whose "Practical Fruit Gardener" was published in 1724. In this the whole range of fruit culture is treated in a terse and clear style, and on every page it bears witness to a practical knowledge which was not too common in writers of those days. That SWITZER had no great opinion of QUINTINYE'S work is evident, and he speaks of his "round-about way" of conveying his opinions, but he is occasionally "oblidged" to admit that QUINTINYE was at times in the right.

SWITZER was a nurseryman; his advice on stocks was therefore from first-hand experience, and it is curious to note in this matter how little things have changed since his day. His book must be given a very important place in British fruit literature, and some writers have even gone so far as to consider it the first book on fruit culture of any value.

The next work of importance is the "Pomona" of BATTY LANGLEY. This is a folio volume; it was published in 1729, and is of interest as the first work in the English language which attempts to illustrate the different varieties of fruits. These illustrations are line drawings, but they certainly show a real appreciation of the characters of the fruits. The remarks on cultivation and descriptions of varieties do not present any special features, but the work was evidently popular, as it is frequently met with despite the adjective "rare," so often used in booksellers' catalogues. The author was born in 1696; he was an architect and garden designer, and published several books on this subject.

The remaining authors of the eighteenth century, such as HITT, the prolific ABERCROMBIE, and the voluble FORSYTH, need not for our present purpose detain us. The details of culture had been well thrashed out by previous authors, and little room for innovations was left. The development of pomology henceforward was mainly in the systematic description, and in the raising of new varieties.

There is, however, one author, L'ABBÉ SCHABOL, whose work is at first a seeming contradiction to this statement, though in fact it is not so. His contribution consists in placing on record the remarkable system of peach training which had for long been practised by the gardeners of Montreuil. In the "Journal Économique" of 1755 this method was explained to the great confusion of the scientific, who found untutored peasants training their trees on scientifically correct principles. It was SCHABOL'S good fortune to publish this method to the world, at first in the publication above-mentioned and afterwards in his "Dictionnaire des Jardiniers," 1767, and his "La Pratique du Jardinage," 1772. The latter work well repays study, as the instructions for pruning and the systems of training are described and figured with much detail, and several novel practices are there to be found.

It is necessary to return now to Continental writers to see the dawn of that greater exactitude in description which was to raise pomology to a branch of applied botany.

The introduction of a scientific method into pomological descriptions commences with DUHAMEL's famous "*Traité des Arbres Fruitiers*," which was published in 1768. This versatile writer, an analogue of our own JOHN EVELYN, published an enormous number of practical books on commercial processes, from clay pipes to Turkey carpets. He was, however, a trained botanist, and with the help of some keen fruit-growers, DENAINVILLIERS, LE BERRIAYS, and others, he produced a book which set a new standard of accuracy. The discussion in the preface of the characters which are sufficiently constant to be available as recognition marks is extremely good. He also realized that all the tree characters must be included in any accurate description. His illustrator was happily well supervised, and we therefore have fruits with their own leaves in true character, a feature rare in illustrations of fruits, where, for example, one leaf often serves for all the pears.

In the history of pomological literature, therefore, DUHAMEL stands prominent between the old and the new, and his influence may be traced in many of the books which followed. It will be convenient here to mention the many editions of his work, or rather of works to which his name was affixed. The first edition was the "*Traité des Arbres Fruitiers*," as mentioned above, 2 vols., Paris, 1768. A new edition in 3 vols. 8vo. was published in Paris in 1782, and a pirated edition at Brussels in the same year. A coloured edition, extracted from the great "*Traité des Arbres et Arbustes*," was then prepared by MIRBEL, POIRET, and other famous botanists. This also bears the old title, but is described as a "*nouvelle édition*" and is without date. It contains 150 plates from the designs of REDOUTÉ and BESSA. This may be called the first coloured edition. The second coloured edition was entitled "*Nouveau Traité des Arbres Fruitiers*"; it has 154 plates, and is edited by the same authors. As, however, neither of these editions is dated, it may be that their order should be reversed. The next edition (third coloured) was a sumptuous series of six volumes, containing 418 plates of great excellence. This was published by the house of Levrault, of Paris and Strasbourg, 1807-1835. It should be stated that the plates are numbered up to 329, but the total is made up by duplicated numbers. The last edition was practically a new work and is entitled "*Pomologie Française*," edited by A. POITEAU, 4 vols. in folio, Paris, 1838-1846, 433 coloured plates.

These various editions of DUHAMEL's work have been dealt with at some length, as they are somewhat confusing at first, and furthermore they represent in the later editions the finest and most complete works that can be found upon this subject.

Among the remarkable French works of the eighteenth century, it is impossible to overlook the "*Histoire Naturelle des Fraisiers*" of ANTOINE DUCHESNE, which was published in 1766. As a monograph treating garden varieties of fruits with botanical exactitude, this little work stands alone for its period. On the historical and cultural

sides it is of no less interest, and in the history of strawberry literature it forms a starting-point of the utmost value.

In the nineteenth century the pomological literature of different countries entered upon more independent courses, and it will therefore be more convenient now to deal with each country separately, from 1800 to the present day.

LITERATURE OF THE NINETEENTH CENTURY.

GERMAN, AUSTRIAN, AND HUNGARIAN WORKS.

As the contributions of German authors have not yet been mentioned, it will be well to recall first the earlier works, *i.e.* those produced before 1800. In the Middle Ages, Germany was too much occupied in the rivalries of churches militant to give time for developing the peaceful arts. It is not surprising, therefore, that the pomological literature of those days is scanty, and it is not until the nineteenth century that such a literature really began. Rare books, of course, appeared from time to time, such as the "*Oenographia*" of FR. HELBACH, which was published in 1604, but the literature even of the eighteenth century was very largely based upon foreign authors. Such were, for instance, the "*Neue Gartenlust*" of HESSE, published in 1714, which was largely based on MERLET's "*Abrégé des Bons Fruits*," and the "*Baumgärtnerei*" of 1763, adapted from LE GENDRE.

The first native work of real importance is the "*Pomona Franconica*" of J. MAYER, published in three quarto volumes at Nürnberg, 1776-1801. The 253 coloured illustrations, though rather crude, are nevertheless very useful, and a French translation of the text is given in parallel columns. This work was doubtless published in a limited edition only, and is now extremely scarce in a complete state.

The year 1780 saw the publication of the first serious attempt at a classification of fruits. The author was H. L. MANGER, Inspector of Buildings to the Queen of Prussia. The book, "*Vollständige Anleitung zu einer systematischen Pomologie*," is a folio of 192 pages, and contains two plates illustrating his classification by form. In the tabular arrangement, resembling that adopted later by THOMPSON in his R.H.S. Catalogue of Fruits, and in the historical notes, there is much of great interest. MANGER was the first of the great school of systematic pomologists which gave Germany so prominent a place in the early part of the nineteenth century.

An Austrian pomology of importance was the "*Pomona Austriaca*" of JOHANN KRAFT, published at Vienna in 1790-1796, 2 vols., with 200 fine coloured plates. This is a work of great value, especially for the South European varieties of fruits.

The opening years of the nineteenth century saw a remarkable expansion of a native literature, and the interest in fruit culture was greatly stimulated by the works of CHRIST, DIEL, and DITTRICH. The first named, CHRIST, was a country parson, and his works were mostly of a popular nature and did much to encourage the farmer and small

gardener to take up the cultivation of fruit. It may be said here that, though such works are not of importance in this survey of pomological literature, they are of the greatest value, and no reproach is intended in the use of the word popular in this connexion. It is the small books which have done most to create an interest in fruit culture, as they have reached the gardener directly. CHRIST's two works which bring him into the scope of this article are the "Pomologisch-praktisches Handwörterbuch" and the "Vollständige Pomologie." The first is a stout quarto of 431 pages and is arranged in dictionary form, giving descriptions of fruits and explanations of all the terms used in fruit culture. It was translated into Flemish by SERRURIER. The "Vollständige Pomologie" was published in two volumes at Frankfort in 1809-13, the first dealing with pomaceous fruits, the second with stone and bush fruits. This was a systematic work, giving full descriptions of varieties, and is still of great value.

FRIEDRICH A. A. DIEL was a fashionable physician at Ems, but his spare time and his years of retirement were devoted to pomology. His publications were almost entirely systematic, and they form a most valuable record of the varieties of the day. DIEL was fortunately also a grower of fruits on a large scale, and his nursery was of considerable extent. His most important book was entitled "Versuch einer systematischen Beschreibung in Deutschland vorhandener Kernobstsorten," 24 8vo. volumes, Frankfort, 1799-1825. It consists entirely of descriptions of fruits. Synonyms and references to literature are given, and tree characters are noted. This work is one of the classics of pomological literature, and occupies a place therein almost of equal importance to the "Species Plantarum" in botanical literature. A useful index was published by H. MEYER in 1834. The famous classification of fruits was published in the first volume, and it is upon this that LUCAS built the system used in Germany at the present time.

DIEL's work had only three coloured illustrations, and the need was felt for a book which should illustrate the varieties he had described. This was supplied by Baron VON AEHRENTHAL, who published about 1837 the first volume of "Deutschlands Kernobstsorten." (Three quarto volumes, Leitmeritz, 1833-1842?) This contains ninety-eight coloured plates, each illustrating four fruits. He describes the fruit and the tree in a concise manner. Publication was discontinued after the death of the editor. This is a scarce work, rarely found in libraries, but a copy exists in the British Museum.

The year 1819 was notable for the remarkable monograph on the cherry by TRUCHSESS, entitled "Systematische Classification und Beschreibung der Kirschensorten, von Christian Freiherr von Truchsess." This stout octavo volume of some 700 pages describes with great detail some hundreds of varieties.

The "Systematisches Handbuch der Obstkunde" of DITTRICH was published in 1837, and consists of three octavo volumes, each over 600 pages. This is a purely descriptive work and is of some importance, though not equal to that of DIEL.

A finely illustrated work based on DITTRICH's book was published later, entitled "Deutsches Obstcabinet in naturgetreuen fein-colorirten Abbildungen . . . zu Dittrichs systematischem Handbuch. . ." (4to., Jena, 1855-6-7-8). This is a very valuable book. The plates are a little rough, but are all well drawn. Apples are shown in section as well as the whole fruit. The core is generally drawn separately, as are the seeds. In the section dealing with peaches, leaves and flowers are added. A notable feature is the excellent series of cherries and nuts, the latter having nowhere—as far as I have found—been so well illustrated in colour. The text is occupied only with references to the plates, and does not supplant DITTRICH's own descriptions.

There is some difficulty as to the different editions of this work. The first is probably dated 1853-60, but as I have never seen this I quote above from the edition in my possession, which is probably the second.

There are two other systematic pomologists whose works were published about this time who deserve mention. The first is F. W. HINKERT, Principal of the Pomological School of Weyhenstephan. His work consists of three octavo volumes and was entitled "Systematisch-geordnetes Handbuch der Pomologie" (Munich, 1836). It describes all hardy fruits in a clear manner, and is a work which, if not indispensable, is a desirable occupant of a pomologist's library.

DOCHNAHL's work, "Der sichere Führer in der Obstkunde," was published in four small octavo volumes. The first (1855) describes 1263 apples; the second (1856) 1050 pears; the third (1858) is devoted to stone fruits, and the last (1860) to nuts and small fruits. By a careful system of abbreviation an enormous amount of information was compressed into these small volumes, each of which can be put into the pocket. A great feature is the careful synonymy, which forms a valuable guide to other literature. All fruits are classified, and in some cases the system is original. The descriptions are of necessity somewhat brief, but the work as a whole is invaluable for reference.

In 1859 the publication of the classical "Illustriertes Handbuch der Obstkunde" was begun under the joint editorship of JAHN, LUCAS, and OBERDIECK. This work contains without doubt more descriptions of fruits than can be found in any other publication. It consists of eight volumes. A general index was published with the eighth volume in 1875. The plan of the work is to give an outline drawing of each fruit with a full description; and while the earlier volumes deal with one kind of fruit only, *e.g.* vol. i., apples, vol. ii., pears, later issues take all fruits so as to bring it up to date. It would be difficult to overrate the importance of this work in the history of German fruit culture, both for its value as the standard work of reference for the old varieties and for the publication of accurate descriptions of the new ones. Three supplementary volumes must be added to the nine mentioned above: a list of additions and corrections, "Zusätze und Berichtigungen zu Bänden i. und iv.," by J. OBERDIECK, 1868, a supplementary volume on pears by LUCAS and OBERDIECK,

published in 1879, and one edited by LAUCHE, published in 1883 including the more modern varieties.

Of quite recent works there are a few well worthy of inclusion, and among the most important stands "Deutschlands Apfelsorten," by Dr. TH. ENGELBRECHT (Braunschweig, 1889, 8vo.). This work, as the title indicates, is entirely devoted to apples, and no fewer than 688 varieties are described, each being illustrated by an outline figure. The arrangement follows the DIEL-LUCAS system of classification. The fruit alone is described, but very fully, and certain details, such as the pistil characters, are not to be found in other works. References to literature are also given. The varieties described are naturally mostly of German origin, but a large number of the fruits are those of other countries.

A good work, with coloured plates, is the "Aepfel und Birnen" of GOETHE, DEGENKOLB, and MERTENS, an octavo volume published at Berlin in 1894. This describes briefly a selected list of 53 apples and 51 pears. A coloured plate of moderate merit is given of each sort. The work is useful for certain of the newer German varieties not figured elsewhere.

Of modern German works none better can be selected than "Deutsche Pomologie" by W. LAUCHE. This consists of six volumes, of which two are devoted to the apple, two to the pear, one to cherries and plums, and one to apricots, peaches, and grapes. The lithographed figures are very well produced, the colours being exact. A leaf and a flower are generally included. The whole plant is described, and references are given to history and literature.

MAURER'S "Stachelbeerbuch, über die besten und verbreitetsten Stachelbeersorten" (zusammengestellt von Louis Maurer, Stuttgart, 1913) is without doubt the finest monograph on the gooseberry that has yet appeared. One hundred and fifty-eight varieties are described and photographed, and fourteen coloured plates are added. The descriptions are the most detailed, and the name of MAURER is enough to ensure that they are the result of long and careful study. Very valuable are the preliminary notes on the constant characters used in description.

It will be noticed that all the works so far mentioned are systematic, and not cultural. Of the latter so many are produced that it is difficult to select any one as a typical example. In Germany, however, the works of GAUCHER have long been accorded a premier place for instructions on pruning, training, &c., and it will therefore be necessary only to refer to these.

The most elaborate is the "Handbuch der Obstkultur," by NICHOLAS GAUCHER, one portrait, 625 woodcuts, and 16 tables. This colossal work has already run into four editions, and for detailed instructions as to training trees it is probably unique.

A smaller work dealing with less detail on cultural matters is the "Obstbaukunde" by the same author, with 211 woodcuts (Berlin, 1912, 2nd edition). It provides ample information for the average gardener, and can be thoroughly recommended.

A recent work of CARL MATHIEU, entitled "Nomenclator Pomologicus, Verzeichnis der im Handel und in Kultur befindlichen Obstarten, mit ihren Synonymen oder Doppelnamen" (Berlin, 1889), gives, as the title indicates, a list of names and synonyms with references to literature, and serves therefore as an index to pomological literature. It is of the greatest value in hunting up varieties, or as a record of names already applied, and is the most complete work of its sort yet attempted.

There are a few periodical publications which cannot be overlooked, and the most important of these are the "Pomologische Monatshefte." This valuable work was first published in 1855, under the editorship of OBERDIECK and EDUARD LUCAS, as the "Monatsschrift für Pomologie und praktischen Obstbau." It is continued at the present day as the "Deutsche Obstbauzeitung," and is the organ of the Deutsche Pomologen Verein at Eisenach. This is an extremely valuable publication, and represents a complete history of German pomology for 57 years. The coloured plates are of moderate excellence, and the articles are written by the best experts of the time. It is at present, as far as I know, the only real pomological journal published where new varieties are described and figured.

An older work of value is "Der Deutsche Obstgärtner" of J. V. SICKLER. This consists of 22 octavo volumes, and was first published in 1794. The illustrations are rather crude, but valuable for their date, and some interesting historical articles by SICKLER himself give the work a special value. The portraits of contemporary pomologists are another interesting feature.

Another publication worthy of mention is the "Zeitschrift für Obst- und Gartenbau," published by the Pomological Society of Saxony at Dresden, 1875-1908. This was called for the first three years the "Sächsische Obstbauzeitung."

The most important Pomology now being published is the "Deutschlands Obstsorten" edited by MÜLLER, GRAU, and BISSMANN. This was begun in 1905, and three fascicles are published each year (except in 1912 and 1913, when six parts were issued in each year). Each part describes four varieties of fruits, with a special full-sized coloured plate. A very important and new feature is a photograph of each variety in the winter state, showing very clearly the different types of growth. The fruit only is described in detail, but full particulars are given as to the habit and preferences of the tree, and a useful summary of bad characters. This work, when complete, will form a most valuable addition, and worthily ends this review of German literature.

FRENCH WORKS.

The nineteenth century in France was remarkable for an output of works on fruits of a variety and excellence which have never been surpassed. The works of DUHAMEL have been mentioned above and need not be referred to further. There were, however, many other

authors in the last half of the century producing works of great excellence, if not of so elaborate a character.

The first of them was "Le Jardin Fruitier" of NOISETTE (3 vols. 4to., Paris, 1821). NOISETTE was a well-known nurseryman, and his name is still commemorated by a class of rose named after him. The first volume deals with cultivation; the second describes the fruits; and the third is composed of coloured plates. These, though not of first-class merit, are nevertheless quite good and are evidently drawn by a pomologist. A second edition of this popular work was published in 1839, 2 vols. 8vo. The plates in this edition are by P. BESSA, artist at the Museum of Natural History at Paris, and are coloured lithographs of merit. The second edition is therefore preferable for the plates and figures of many additional varieties.

The lavish expenditure of the Second Empire was not without its benefits to fruit literature, as to Imperial generosity we owe the magnificent "Jardin Fruitier du Muséum." The author, JOSEPH DECAISNE, was Director of the Museum, now the Jardin des Plantes, and was a student under ADRIEN DE JUSSIEU. His training as a botanist was of great value, and his first works were all of descriptive and economic botany. The first volume of his work was published in 1858, and it was completed by the eighth volume, published in 1873. Of the colouring of the plates it is impossible to speak too highly; the lithographs are magnificent, and no pomological work has ever approached them for correctness of colouring. The drawing is of equal merit, and the wood and leaves of each fruit shown are indicated in outline with the greatest exactitude. The work deals mainly with pears, and vol. i. contains an elaborate monograph on the species from which the garden varieties have been derived. Peaches, a few plums and strawberries are figured, the last being described by Madame Vilmorin. It is a matter for regret that this splendid work had to be discontinued before the apples were undertaken, as, if complete, it would stand without a rival.

The next important work was the "Pomologie Générale de la France," published at Lyon by the Congrès Pomologique de France. This excellent work consists of 8 vols. large 8vo. (1863-1871), with coloured plates of each fruit. Only such fruits as were admitted by the Congress as of merit were included. The question of synonyms was fully dealt with, and the descriptions are most full and reliable. The fruits, leaves, shoots, and fruit buds are illustrated, and all kinds of fruits are included. The work as a whole forms a most valuable guide to French fruits, and is quite indispensable.

In 1865 a useful descriptive work was published by M. P. DE MORTILLET, a nurseryman of Grenoble, the first volume dealing with peaches. The second appeared in 1866 and describes cherries, and the third in 1868 is upon pears. The title is "Les Meilleurs Fruits par Ordre de Maturité et par Série de Mérite" (Grenoble, 1865-68). A curious feature is that much of the information is given in the question and answer form, a young man, "Léon," providing the questions

and the author the answers. This work is valuable, and the descriptions and outline drawings of fruits by the author alike give evidence of first-hand observation. Of special note is the treatment of the cherries, for which Grenoble has long been famous. The volume on pears is occupied largely with cultural matter, those described being a selected list.

Good as this work was, it was overshadowed by the masterly "Dictionnaire de Pomologie" of ANDRÉ LEROY, of which the publication was begun in 1867 and continued until 1879. Up to this time no such work had been published, and its treatment of certain points, such as, for example, historical references, make it even to-day a mine of information not to be found elsewhere. The descriptions of the fruits are not quite so full as those of the "Pomologie de la France" above referred to, but they are precise and generally sufficient. Outline drawings are given of each fruit, and often, where the variety is variable, two typical forms. Some idea of the extent of the work will be given by the following figures of fruits described: Pears, 915; apples, 525; peaches, 124; apricots, 43; cherries, 127. A volume on plums was in preparation, but the author's death prevented its publication. A very valuable feature is a reference under each variety to the authors who have previously described it. It is therefore possible to see at once the history of the fruit and to refer to the first record of the name. Another feature of great value is the addition of an historical sketch of each kind of fruit, showing in a most interesting manner the development, for instance, of the pear from Roman times to the present day. We may perhaps demur to a tendency to identify certain of our oldest fruits with those of Roman authors, as this, owing to the vague descriptions of those days, must be largely a matter of guesswork. These details and the elaborate and critical histories of each variety are the remarkable features of this invaluable work. A useful bibliography is to be found in the last volume.

The last of the great French systematic school was ALPHONSE MAS, who was born at Lyon in 1817. His life was entirely devoted to the study of fruit, and his garden at Bourg contained probably one of the finest collections of fruits ever gathered together in one place. His first book was "Le Verger, ou Histoire, Culture et Description des Variétés de Fruits le plus généralement connus" (8 vols. 8vo., Paris, Masson, no date, probably 1865-1874). It is entirely descriptive, and coloured plates are given of each fruit. These plates are of fair merit, the fruit alone being depicted. The great value of this work, however, lies in the remarkable descriptions. Wood, flowers, and leaves are all described with the greatest precision. MAS had a skill approaching genius for finding the happy word in this matter, and his remarks on the character of the tree as a whole are wonderfully suggestive. References are given to previous descriptions and to synonyms, but the historical notes are few and curt. A combination of this work and of the "Dictionnaire" of LEROY would make an ideal pomology. All hardy fruits are described except bush fruits,

raspberries, and strawberries. This work was, however, a selection of the best fruits, and the records of other fruits of less importance were published in his "*Pomologie Générale*" (1872-1883, 12 vols. 8vo.). In these volumes the fruits are discussed in the same detail as in "*Le Verger*," but the illustrations are outline drawings. As an indication of the extent of the work it may be stated that 581 pears, 253 apples, 147 plums, 71 cherries, and 22 peaches are all fully described. These two works of MAS are quite indispensable in any pomological library.

The last two descriptive works of importance which it is necessary to notice are published by the National Horticultural Society of France and by the Pomological Society, whose headquarters are at Lyon. The first-named published its work under the following title:— "*Les Meilleurs Fruits au Début du XX^{me} Siècle ; Histoire, Description, Origine et Synonymes de 250 Variétés Fruitières recommandées*" (Paris, large 8vo., no date—about 1907). Each fruit is shortly described and illustrated with line drawings of great excellence. All hardy fruits are described, and cultural notes are included for each kind. This work is especially useful as a selection of the most worthy fruits. It is not sold, but presented to members of the Society.

The work of the Lyon Society is on similar lines and is entitled "*Catalogue Descriptif des Fruits adoptés par le Congrès Pomologique*," Lyon, 8vo. 1887, Suppl. 1896. It is entirely descriptive, and each fruit is illustrated by an outline drawing. The descriptions are not very full, and tree characters are scantily described. This work is useful for its records of some of the newer fruits, but it is not so good as the production of the Paris Society.

A useful work was published in 1876 by the well-known nurserymen SIMON-LOUIS FRÈRES, of Metz, entitled "*Guide Pratique de l'Amateur de Fruits*." A very large number of fruits are briefly described, and while these descriptions consist only of a few lines, they are useful for the amateur. At the end of the work is an index, with an extensive list of synonyms, and this part is the most valuable feature of the work. A second and enlarged edition appeared in 1895.

It is necessary now to mention a few works on cultivation which have not been included in the above list. The French gardeners have always been famous for the refinements of training and grafting, and very many works have appeared on this subject. An author who had a great vogue in the middle of the last century was A. DU BREUIL. His best known works, "*Instruction élémentaire sur la Conduite des Arbres Fruitiers*" (1854) and "*Cours élémentaire Théorique et Pratique d'Arboriculture*" (5th edition, 1865), represent in an able manner the knowledge and opinions of his time upon all cultural matters.

A very interesting little work on grafting was published about 1868 by A. THOUIN, then Professor at the Muséum d'Histoire Naturelle at Paris. The title is "*Monographie des Greffes, ou Description technique des diverses sortes des Greffes employées pour la Multiplica-*

tion des Végétaux" (Paris, 8vo., 8 plates). There are a remarkable number of different methods here described and figured.

A very practical work, less detailed than that of DU BREUIL, was written by GRESSENT and entitled "L'Arboriculture Fruitière" (Paris, 1862). It is a very good general treatise, which does not enter too fully into the more elaborate details of training and grafting.

In more recent times CHARLES BALTET's books have had a large circulation. His "L'Art de Greffer" still stands as the best exposition of grafting in all its branches; an English translation was published in 1873, and other editions have since appeared. His other most successful work, "Traité de la Culture Fruitière commerciale et bourgeoise," indicates its scope sufficiently by its title, and has reached many editions.

Of quite modern works there is nothing, for clearness and brevity, to equal "L'Arboriculture Fruitière en Images" by J. VERCIER (Paris, 8vo., 101 plates). This work stands quite alone in giving a complete pictorial guide to the pruning and training of trees, an excellent feature being a drawing showing the pruning to be made and the result on the same page. This book can be highly recommended to all who wish to increase their knowledge of pruning and training fruit trees.

Periodical Literature.—There is not much to be recorded under this heading, though the proceedings of the many horticultural societies in France contain many interesting papers and first records of new varieties. The only important periodical entirely devoted to pomology is the Journal of the Société Pomologique de France, entitled "Pomologie Française." This was first published in 1872, and appears monthly. The "Revue Horticole," begun in 1829, still continues a flourishing course, and contains many excellent articles and coloured plates of fruits.

The Journal of the Société Nationale d'Horticulture de France contains some good articles in its earlier issues, but in recent years original contributions have become less frequent.

[NOTE.—No attempt has been made to refer in the above to the literature of the Vine, both on account of its extent and for its lack of interest to British gardeners.]

ENGLISH WORKS.

The opening years of the nineteenth century were the Golden Age of pomology in this country. The extraordinary expansion of commerce and the great prosperity it brought had an enormous influence upon horticulture and upon its literature. The remarkable output of books, many illustrated in an elaborate and costly manner, is evidence not only of a great gardening interest, but also of the means to encourage it. By a happy chance this period coincided with the appearance of several men whose names will always be prominent in pomological history. THOMAS ANDREW KNIGHT, THOMPSON, LINDLEY,

RONALDS, HOOKER, and BROOKSHAW, all produced their best work between 1800 and 1837, and during that period systematic pomology was established in this country.

The first of the group is THOMAS ANDREW KNIGHT. This gifted man, whose connexion with our Society is too well known to need repetition, was happy in possessing an enthusiasm for horticulture together with the leisure to indulge it. His work shows, unfortunately, the defects of his qualities. His descriptions of fruits are very slight, and some of his theories did not long survive him. Nevertheless, as a fruit breeder and fancier, his work was of the greatest importance. His principal book is the "*Pomona Herefordiensis*" (London, 4to., 1811). This was designed to depict the old cider and perry fruits of Herefordshire, and the plates are extremely good, being prepared by that great fruit-painter WILLIAM HOOKER. In the preface the author describes his method of cross-fertilizing, which seemed to be unknown in England at that time in so far as fruit-breeding was concerned. The work of MILLER had evidently been forgotten or overlooked. The remarks accompanying the plates have reference chiefly to the cider or perry qualities of the fruits. A smaller cultural work was published by KNIGHT in 1797, "*A Treatise on the Culture of the Apple and Pear*," a second edition in 1802, a third in 1808 and 1809, and the fourth in 1813. In this work the author states his famous theory of degeneration or "running out" of fruit, which is now disproved. A number of very valuable papers were contributed by him to the early volumes of the "*Transactions*" of this Society, and these are well worthy of study.

The next author who merits attention is GEORGE BROOKSHAW, who has the distinction of having published the largest work in size and the heaviest (on the scales) in English pomological literature. This is the "*Pomona Britannica*" (London, 1812), atlas folio, plates. It is an entirely descriptive work, and the text, though not giving the information needed by modern standards, is nevertheless good, and the plates are for the most part quite excellent. Especially may be noted the cherries and pine-apples. It is of great value as a record of the varieties of the day, many of which were grown at the Royal Palace of Kensington. BROOKSHAW's second work bore the same title, but was a quarto in two volumes, with ninety plates, and is a popular edition of the larger work. The plates are also very well prepared, and the date of publication is 1817. His last work was called "*The Horticultural Repository, containing the best Varieties of the different Species of English Fruits*." (London, 1823, 8vo.) The coloured plates in this work are extremely coarse, and the work is quite a worthless production. Copies were also issued with plain plates.

In the year 1818 was published the "*Pomona Londinensis*" of WILLIAM HOOKER. The title-page runs: "*Pomona Londinensis, containing the coloured Representations of the best Fruit cultivated in British Gardens. With Descriptions, in which the author is assisted*

by the President and Members of the Horticultural Society " (London, 4to., 1 vol., 49 plates, 1818). This work contains some of the best coloured plates that have been published. The skill of HOOKER as a painter of fruits has never been equalled in this country, and here he is at his best. The descriptions of the fruits are good, and contain some interesting historical matter. It is to be regretted that this valuable publication was discontinued after seven parts only had been issued.

In 1826 the first edition of the " Catalogue of the Fruits cultivated in the Garden of the Horticultural Society of London " was issued. This was largely the work of ROBERT THOMPSON, fruit expert to the Society, and, I venture to think, the greatest English pomologist. The book was prepared to revise nomenclature and to settle the question of synonyms. That it was no mere desk work is evidenced by the volumes of notes and drawings in the Society's possession, in which the names and varieties are discussed by TURNER, LINDLEY, and above all THOMPSON, with the greatest detail. The arrangement of this catalogue is tabular, and the descriptions are of the vaguest, and in no way represent the enormous work which had been done before the true name of the variety had been settled. A second edition was published in 1831, and a third in 1842.

An important work with coloured plates was " The Pomological Magazine, or Figures and Descriptions of the most important Varieties of Fruits cultivated in Great Britain," by JOHN LINDLEY (3 vols. 8vo., 1827-30). This was afterwards reprinted as " Pomologia Britannica " in 3 vols. (1841). Though ostensibly by LINDLEY, the work was mainly due to ROBERT THOMPSON. The descriptions are not all of equal value, but most of them are very full, the wood and leaf being described as well as the fruit. The plates are good, and usually show a young shoot and leaf. The whole book gives evidence of careful observation and testing of varieties.

The year 1831 was notable for two works of importance in British pomological literature. The first of these is " A Guide to the Orchard and Kitchen Garden," by GEORGE LINDLEY, edited by JOHN LINDLEY, London, 1831, 8vo. The author was a nurseryman near Norwich, and the father of JOHN LINDLEY, Secretary to the Horticultural Society. He had been collecting material for this work for some forty years, and the result is a book of the greatest value. The descriptions of the fruit are fairly detailed, and the general notes upon each variety are most useful. A special feature is the record of many East Anglian varieties which are here described for the first time. The historical notes are a mine of information as to English varieties, and the dates of introduction of foreign sorts. LINDLEY's work has never been valued quite at its full worth, though it is without doubt one of the really important English books on pomology.

The next publication which rendered the year 1831 specially notable was the work of HUGH RONALDS entitled " *Pyrus Malus Brentfordiensis*, or a Concise Description of Selected Apples " (London,

1831, 1 vol., 90 pp., 42 coloured plates). The great importance of this work lies in its magnificent coloured plates of English apples. There is no work which has depicted so well and fully the native varieties of this country. The descriptions are short, and not very systematic, but too high praise cannot be given to the coloured drawings. These were done by Miss RONALDS under her father's direction, and I know of no work where the essential points of difference have so well been brought out, or the colours and textures better suggested. RONALDS was a nurseryman at Brentford; his knowledge of apples was gained from a lifelong experience, and his book is a worthy memorial to his labours.

After this book there was a long period in which no works of the first importance were issued, and it was not until the publication of the "Herefordshire Pomona" of HOGG and BULL that a really comprehensive work on fruits appeared.

There is one author whose work, though not of great importance, still merits mention, and this is JOHN ROGERS, the author of "The Fruit Cultivator," the first edition of which was published in 1834, and the second and third editions in 1835 and 1837. This little work bears all the marks of originality, and the author's racy personality is frequently in evidence. Both cultural and descriptive matter are included, and many interesting scraps of history are here to be found. It is an entirely human book, which even the most hardened systematist will benefit by including on his shelves. ROGERS was in his eighty-fourth year when he wrote this, and his opinions and counsels may therefore be considered mature.

In the year 1851 was published the first book by ROBERT HOGG, the pomologist, who for so many years stood high above his contemporaries in this country. This was entitled "The Apple and its Varieties, being a History and Description of the Varieties of Apples cultivated in the Gardens and Orchards of Great Britain" (London, 8vo., 1851; second edition, 1859). This was the first volume of a projected British pomology, a work which was not completed on the lines of this volume, but on the more restricted scale of the "Fruit Manual." This work is arranged alphabetically, describes all the more worthy varieties, and gives outline drawings of seventy fruits. A good feature is the reference to a first authority for the name of each fruit, and also to previous literature and coloured plates. A classification based on the season is introduced, but this was dropped by HOGG in later works for his later system of eye and core characters. This work is extremely useful, and one can only regret that it was not followed by further volumes dealing with other fruits in the same manner. In 1860 the first edition of the famous "Fruit Manual" appeared, a small 8vo. volume of very different appearance from the stout fifth edition. The descriptions are very short, but all hardy fruits are treated. Other editions rapidly followed, the second in 1862, the third in 1866, and the fourth in 1875, which was in size a near approach to the fifth and last edition of 1884. This work is so well

known that any detailed description is unnecessary. Judged by the highest standards, however, it cannot be considered a completely satisfactory production. Such descriptive works should belong to one of two categories: the popular work in simple language for the amateur or the detailed technical work for the expert. "The Fruit Manual" falls between these two. Too detailed and technical for the average amateur, it is not systematic enough to pass into the highest standard. HOGG was too much inclined to treat his fruits as museum specimens. His references to the tree are few indeed, and many things go to show that his study of the fruit commenced with its arrival in the fruit-room rather than with its development on the tree. A small point in confirmation may be quoted. In describing the stems of apples he often refers to a "knobbed" stem or to an "extraordinarily thick and fleshy" one. This character is constant in certain apples, but by no means in all the varieties in which he describes it. A closer acquaintance with the tree itself would have shown that, when the central or "king" blossom of a truss is set, the stem is always much more stout and fleshy and the basin shallower than in those cases where a flower from the side of a truss is set, in which case the stem is always longer. Another fatal error was that HOGG sometimes made his descriptions from a single fruit sent him by a correspondent. This, it is hardly necessary to say, is against all the rules of accurate description, and the fact that he did not realize it throws a doubt on all his work. Another criticism must be passed on his lack of system in description. A character will be mentioned in one fruit and omitted in the next. It is evident also that some of the fruits he included had never been seen by him, as certain descriptions are borrowed without acknowledgment from other writers. Notwithstanding these faults, there is much to be thankful for in the "Fruit Manual," and an especially good feature is the careful historical notes after each variety. HOGG gathered together a huge amount of information, and stands out as the greatest pomologist of his time. One can only regret that a little more care and system were not applied, for they would have made the "Fruit Manual" worthy to stand by the best systematic works of any country.

The most recent pomological work of any extent is the "Herefordshire Pomona." This was edited by Dr. HOGG and Dr. HENRY GRAVES BULL, and published in 1876-1885 (3 vols. 4to.). The text is by Dr. HOGG, and is taken practically word for word from the "Fruit Manual." The introductory chapters upon the history and lore of the apple are by Dr. BULL and are of much interest, especially such parts as relate to the West Country. The coloured plates are very good. A considerable number of fruits is shown on each plate, generally without foliage. This book is valuable for its records of more modern fruits which are not elsewhere figured.

This list comprises all the most important descriptive works published in this country. Of cultural works there has never been so great an output as, for instance, in France. Of the older writers

no one put matters more clearly than ROBERT THOMPSON in his "Gardener's Assistant," and even to-day his directions in the first edition (1859) can hardly be improved. Modern cultural works will be found in the Appendix to this paper.

Periodical Literature.—The most important item in this division is the "Transactions of the Royal Horticultural Society," which were started in 1815. The fine quarto volumes have many articles of great value, and many excellent coloured plates of fruits. The earlier volumes were largely devoted to vegetables and fruits, and in these are many papers from T. A. KNIGHT.

Any detailed reference to important papers is, of course, not possible here, but the work of GEORGE LINDLEY on Peaches, vol. 5, and the valuable monographs by JAMES BARNET on the Strawberry, vol. 6, and of ROBERT THOMPSON upon Apricots, Cherries, and Gooseberries in vol. 1, second series, are well worthy of study.

There has been no strictly pomological publication in this country, and of the general gardening papers the best for illustrations and descriptions is the "Florist and Pomologist" (1862-1884), which contains valuable figures of fruits of fairly recent times not elsewhere to be found. It is not necessary to refer to the many excellent gardening papers which exist at the present day, as they are well known.

AMERICAN WORKS.

The history of American Pomology can be traced back to the early days after the arrival of the "Mayflower," and there is plenty of evidence that one of the first occupations of the settlers was the production of fruits. It was, however, many years before a native literature appeared, and the first work which comes within the scope of this paper was not published until the nineteenth century. This is the well-known work of WILLIAM COXE: "A View of the Cultivation of Fruit Trees and the Management of Orchards and Cider. . ." (Philadelphia, 8vo., 1817). This book is of great importance in many ways, but most of all for its early records of native varieties. The custom of raising fruits from seed, owing to the difficulties of distribution, has resulted in an enormous number of local varieties which, as communication improved, began to spread their fame. The uncertainties of nomenclature may be imagined, and it was COXE who first tackled this very difficult question. The work is largely descriptive, and many of the fruits are illustrated by coarse woodcuts. His descriptions are fairly complete, and the historical notes which are sometimes appended are most valuable. COXE was an observer, and his work gives evidence of original work in many directions and may be considered the foundation of American pomological literature.

The next published work was "The American Orchardist" of Dr. JAMES THACHER, Boston, 1822. It is mainly cultural and largely adopted from other authors, and need not therefore be described in detail.

From this date onwards many books were published, and some, such as "The New American Orchardist" of WILLIAM KENRICK, and the "Pomological Manual" of WILLIAM PRINCE, had much success.

In 1833 a reprint of LINDLEY'S "Guide to the Orchard" was edited by MICHAEL FLOY and adapted for American readers. In 1845 was published the famous work of A. J. DOWNING, which has taken from that time until the present day a most important position in America. The title will indicate its scope: "The Fruits and Fruit Trees of America, or the Culture, Propagation, and Management, in the Garden and Orchard, of Fruit Trees generally, with Descriptions of all the finest Varieties of Fruits, Native and Foreign, cultivated in this Country," roy. 8vo., 1 vol., New York, 1845). DOWNING was a nurseryman and was brought up among fruits, and while his book cannot compare with the systematic works which were being published at this time in Europe, he had an enormous influence in the encouragement of fruit-growing in America. A second edition, published in 1847, has several coloured plates, the first edition having only outline drawings. Space will not permit an enumeration of the many editions which have been issued of this work, the last being in 1886.

Another work of very similar character was "The American Fruit Culturalist" of J. J. THOMAS, first published in 1846. This is cultural and descriptive and of the popular handbook order, and had achieved twenty-one editions by 1905.

In 1852 the first American Pomology on an extensive scale, with coloured plates, was published. This was "The Fruits of America," by C. M. HOVEY. Fairly good descriptions are given, and the plates, lithographs of a rather crude order, show the young wood, spurs, and leaves. It is a useful work, but not comparable with more recent works published in the same country.

Useful as were such works, there was no originality of treatment nor any really scientific description of fruits in them. The first author who can claim to have made a real contribution to pomology is Dr. JOHN A. WARDER, who, in his "American Pomology," brought forward an original system of classification of apples. This work was published in 1867, and is occupied with the cultivation and description of apples only. This classification, like many others, was based first of all upon shape, and then subdivided into sections as to sweetness, colour, &c. He then proceeds to describe the fruits so classified, and these descriptions (of the fruit only) are a great advance on any previous work of the kind in his country. Very good outline drawings are given of many varieties.

The day of the nurseryman and amateur as pomological authors is now fast disappearing in America, and their place is filled by a benevolent Government which provides unlimited funds and expert specialists to write the books. The result of this combination is a happy one, and it is no exaggeration to say that never has pomology been so well supported as it is to-day in America. In no country are

so many really fine systematic books now being produced, and recent publications have set a standard of exactness which cannot but benefit the study of fruits all over the world.

The first of these works is "The Apples of New York," by S. A. BEACH (2 vols. 8vo., Albany, 1905). This is a purely descriptive work, with coloured plates or photographs of most of the varieties described. The descriptions are remarkably detailed, and deal with the tree as well as the fruit. References to literature are given very fully, and the commercial value and climatic preferences of the fruits are fully described. Of particular value is an introductory chapter dealing with characters which are of value in describing apples. This work is the best book on American apples, and is quite indispensable.

The next work of the same series is "The Grapes of New York," by U. P. HEDRICK (Albany, 1908). This is a large quarto volume with full-sized coloured plates. An extremely interesting chapter prefaces the descriptions dealing with the various attempts to acclimatize the European vine in America. The descriptions themselves are a model of what such things should be, and no feature is overlooked. A very valuable point in all these works is that the fruits are described on a regular and definite system.

The next volume of this series is "The Plums of New York," also by Professor HEDRICK, uniform with the last named and published in Albany in 1911. This is exactly on the same lines as that on the grapes, and the introductory chapters, one historical, and another discussing the species from which have been developed the plums of the present day, are most valuable. Though dealing primarily with American varieties, European sorts which do well in the State of New York are included. There is no finer work on plums at the present time, and it is good to hear that further volumes on peaches and cherries are in course of preparation.

Two works of reference which are quite indispensable are those compiled by W. H. RAGAN. The first is entitled "Nomenclature of the Apple, a Catalogue of the known Varieties referred to in American Publications from 1804 to 1904" (Washington, 1905). This is a useful work for establishing the priority of any name, and a short description of the fruit is given by a system of abbreviations which generally suffice to separate one fruit from another bearing the same name.

A similar work, entitled "Nomenclature of the Pear," was published by the same author in 1908, and is on the same lines as the above, with the addition of a reference to literature in many cases.

Several excellent monographs have been published under State auspices in recent years, such as that on "The Fig," by GUSTAV EISEN (Washington, 1901), and other works which are referred to under their separate headings in the Appendix.

Of the many excellent cultural works there is not space to treat here. A special feature of recent years is the large number of very practical works on commercial fruit-growing, some of which will be found under the heading "Fruit Farming" in the Appendix.

Periodical Literature.—Of the first importance under this heading is the valuable "Report of the American Pomological Society," issued biennially from 1852 to the present time. Many very interesting papers and reports will be found in it.

The only periodical works, I believe, devoted entirely to pomology are the "North American Pomologist" of HOFFEY (only vol. 1, 1860, published), and "The Orchardist's Companion," by the same author (Philadelphia, 1841-3). This is a quarto, with full-sized coloured lithographs by the author, and is an interesting work historically, being the first American work with coloured plates of fruits. Unfortunately, public support did not suffice to permit its continued publication.

The reports of the U.S.A. Department of Agriculture (1862-1894), and the "Year-Book" published annually since that date, contain many good plates and descriptions of new and interesting fruits.

DUTCH WORKS.

A comparison of the literature of Holland with the interest and excellence in gardening of the Dutch is somewhat surprising. The Dutch evidently did not suffer from the *Cacoethes scribendi*, and it is not until the middle of the eighteenth century that we find any really important work. The culture of oranges and other citrous fruits was in great favour in the seventeenth century, and a few works were published upon their treatment, such as the "Citricultura" of FR. VAN STERBEECK, 1682, and the "Nederlantze Hesperides" of COMMELYN in 1676. Other gardening books, such as the "Nederlandsen Hof" of VAN OOSTEN and the "Pomona" of J. C. DOOR (1663), touch briefly upon fruits, but these need not be considered here.

The first great work of real importance was the "Pomologia" of J. H. KNOOP, which was published at Leeuwarden in 1758. It is of special interest as the first pomological work which was fully illustrated with coloured plates. As may be expected, the colouring is somewhat crude, but nevertheless a very good idea of the various fruits is given. This work had great popularity and many editions were published, also a translation into French. A German translation, published at Nürnberg in 1760, should be noted, as the second volume is an entirely new production, the author being, on the authority of MAYER, Pastor ZINK, of Meiningen. KNOOP's work is wholly descriptive, as he had treated cultural matters in an earlier volume, namely, "Beschouwende en Werkdagige Hoveniers-Konst" (Leeuwarden, 1753).

From this date until recent times there is a remarkable gap in Dutch pomological literature, and I can find no work of real importance until the work of VAN NOORT, "Pomologia Batava, of Avbeelding en Beschryving van onderscheidene soorten van Appelen en Peeren" (Leiden, 1830-1840; 20 apples and 20 pears illustrated), which I have not yet seen.

A modern work of great value on account of its record of Dutch varieties not figured elsewhere is the "*Nederlandsche Boomgard*," which was published at Boskoop in 1868. The editors were OTTOLANDER-KOSTER, HOOFTMAN, and OVEREIJNDER, and the coloured plates were by BERGHUIS. These plates are excellent, and the descriptions given full and exact.

PORTUGUESE WORKS.

I have been able to find only one book of strictly pomological interest in Portuguese—the "*Diccionario das Peras Portuguezas*" by OLIVIERIA (Oporto, 1879, large 8vo.). There is doubtless much to be added to this list.

SPANISH WORKS.

The pomological literature of Spain seems to be very scanty. In the elaborate "*Diccionario de Bibliografia Agronomica*" by ANTON RAMIREZ, no work of importance is recorded. The only books I have seen are those of D. F. SALA Y ARNELLA, entitled "*Frutales*" (Barcelona, 1860, 8vo.), a small cultural work upon the origin and cultivation of fruit trees, dealing with them from the nursery stage upwards, and the "*Pomona de la Provincia de Murcia*" of DON JOSÉ Y PEREZ (Madrid, 1884, 4to.), with short cultural notes and fairly full descriptions of various fruits.

A few interesting papers may be found in certain journals, such as the "*Agricultura Española*" (1858-61) (vol. 1 contains a list of Pears and Almonds), and in the "*Boletin d'Agricultura*" (Madrid, 1857).

RUSSIAN WORKS.

Russian works on pomology are not many, and I believe the following names include the most important:—"Kratkaya Pomologia," by USSIKOV (Petrograd, 1900), an octavo volume with plain lithographs of apples and pears. Plums and peaches, &c., are described, but not figured. "*Pomologie*," by LEON SIMIRENKO (8vo., 1901), contains photographs of nearly all fruits, with special reference to Crimean varieties. A new and enlarged edition appeared later.

The finest work is probably the "*Atlas Plodov*" (Petrograd, 1903-7, 4 vols. large 8vo.), with 100 coloured plates. This is a magnificent work which equals the best done in France or England. The plates for the most part are original and of great merit, both pomological and artistic. Some few of the illustrations, however, are borrowed, from the "*Aepfel und Birnen*" of GOETHE and others, and these are markedly inferior. So far as I can ascertain, this book is the best and most complete Russian work yet published.

An index of names in roman type renders it useful to those who do not read Russian.

BELGIAN WORKS.

The pomological literature of Belgium will naturally only date from the early nineteenth century, though certain small works, such as "*Essai sur la Greffe*," by CABANIS (Liège, 1784), antedate that period. The independent and important horticultural history of Belgium, however, reached its highest point in the middle of the last century, and its literature naturally reflects this period.

The first work which claimed readers beyond the national boundaries was the work of VAN MONS, "*Arbres Fruitiers. Leur Culture en Belgique et leur Propagation par Graine*" (Louvain, 1835). This work contains the fullest statement of the famous theory of VAN MONS on raising seedling fruits. It must be confessed that the student will have to search carefully therein to find this theory, so overlaid is it with repetition and contradictions. The work, however, provided material for many lengthy disputations, and so served a useful purpose as a stimulant if not as an exposition.

Of greater interest for our present purpose is the catalogue of his nursery, "*Catalogue Descriptif Abrégé, contenant une Partie des Arbres Fruitiers qui depuis 1798 jusqu'en 1823 ont formé la Collection de J. B. Van Mons . . .*" (Louvain, 1823, 8vo.). The historical value of this little work is very great, and it is now exceedingly scarce.

The successor to VAN MONS was ALEXANDRE BIVORT, and in 1847-51 he published his "*Album de Pomologie*," an oblong folio in four volumes. This book is of great value as it contains coloured plates and accurate descriptions of many of Van Mons' seedlings, and forms a wonderful record of the great number of new fruits which were at this time being raised in Belgium. The coloured plates are fairly good, better in the later volumes, and the descriptions are excellent.

The next important work was the result of royal munificence, and was entitled "*Annales de Pomologie Belge et Étrangère*." This was edited by L. DE BAVAY, AUGUSTE ROYER, AUGUSTE HENNAU, and BIVORT. Eight large folio volumes were published, the first in 1853 and the last in 1860. The descriptions of many fruits are taken from BIVORT's "*Album*," but the greater number are original. The plates are well produced, but are not quite of the highest excellence. This work had a great success and remains the classical work of reference, with BIVORT's "*Album*," for varieties of Belgian origin. Since 1860 no important pomology has been published in Belgium, but there are two works of historical interest which may be mentioned here. The first is the "*Pomone Tournaisienne*" of J. B. C. DU MORTIER, Tournay, 1869. It is an attempt to record the gains of the Belgian pear-raisers; the author's historical remarks are interesting, and are followed by a list of fruits under their raisers' names; and finally outline drawings and short descriptions are given of ninety-one selected pears.

It must be said, however, that the lists are in several cases incomplete, and the book cannot therefore be entirely relied upon.

A better and more accurate attempt at the same object is the paper on Belgian fruits by CHARLES GILBERT, published in the "Journal of the Royal Linnean Society of Belgium" in 1874. This gives the names of all Belgian raisers and their gains, and includes some very excellent critical notes upon the re-namings that so many of these fruits have undergone.

The cultural works published towards the end of the nineteenth century are very numerous, but they need not be detailed here. Reference cannot, however, be omitted to the excellent work of PIJNAERT, "Les Serres Vergers," which was published about 1880 and contains the fullest directions for the forcing of all fruits under glass with a wealth of detail not met with in any other work I am aware of.

Periodical Literature.—Belgium has been fortunate in her periodical literature, and the skill of her native gardeners and lithographers has made much of it of permanent value. Especially useful is the "Bulletin d'Arboriculture," which was started in 1865. The articles and coloured plates of fruits are numerous and good, and an excellent index added in 1883 renders these readily available.

Another valuable publication is the "Belgique Horticole." This is especially good in historical information, and the complete series runs from 1850 to 1885.

The "Flore des Serres," though generally devoted to flowering plants, has some good plates of fruits, especially in volume 19 (1871-3).

ITALIAN WORKS.

In the earlier part of this paper mention was made of the interesting volume of VENUTI as probably the first book dealing exclusively with fruit. There are also a few other Italian authors who merit attention before the more modern works are considered.

It is natural that early Italian literature should deal very largely with the Vine, but this is rather outside our scope. The authors of the sixteenth and seventeenth centuries were mostly adapters or compilers from the ancients, and such books as that of GIOVANNI TATTI, "Della Agricoltura" (Venice, 1560), with its short notices of fruits, are of interest only historically. A more useful book was that of G. SODERINI, "Trattato della Coltivazione delle Vite e del frutto che se ne può cavare. . ." (Firenze, 1600). The well-known "Vinti giornate d'Agricoltura" of AGOSTINO GALLO (Torino, 1519) is a type of country book which was fairly common at this time.

No really important work, however, was published until 1633, when GIOVANNI BATTISTA FERRARI, a Jesuit monk of Siena, published his "Hesperides, sive de Malorum aureorum cultura et usu." This is a folio, with elaborate plates of oranges and lemons, and of gardens and garden tools. The fruits are very fully described and some

unusual types depicted, which may also be seen in the Dutch works on oranges which followed in the later years of the seventeenth century. It is entirely in Latin, and is a remarkable example of an early treatise upon citrous fruits.

In the eighteenth century I have found little of note ; a translation of "*Le Jardinier François*" was published in 1723, and an interesting book upon the peach, entitled "*Trattato di Coltura di Persici e di Alberi di frutto*" (Venice, 1792). This is an elaborate cultural work of some 240 pages.

The finest Italian pomology was, without doubt, the work of GALLESIO entitled "*Pomona Italiana ossia Trattato degli Alberi Fruttiferi*" (3 vols., 172 coloured plates, Pisa, 1817-39, folio). The plates are of varying merit, some being of great excellence and others very poor. A very special feature is the large number of figs which are illustrated and described. This work is now extremely scarce, but a copy is in the Lindley Library.

A few years later a useful work was prepared by A. PICCIOLO, entitled "*Pomona Toscana, che contiene una breve descrizione di tutti i frutti che si coltivano nel suolo Toscano per servire alla collezione in gesso medesimi*" (Firenze, 1820).

The only recent pomology which has come to my notice is the recent work entitled "*Pomologia: descrizioni delle migliori varietà di Albicocchi, Ciliegi, Meli, Peri, Peschi,*" by GIROLAMO MOLON (Milan, 1901). This is a small octavo of some 700 pages, entirely descriptive, and with a few coloured plates and some photographic illustrations. A useful feature is the very full reference to literature given for each variety, and the discussions on the species should also be mentioned.

SCANDINAVIAN WORKS.

The pomological literature of Scandinavian countries is rarely met with in the libraries of Central Europe, and this list cannot be put forward as including all important works, but is as complete as my present opportunities can make it.

The earlier works were mainly of the cultural order, and the first I have found dealing with fruit trees alone is the "*Konsten at Skära Frukt Träd*" (The Art of Nursing Fruit Trees), by J. J. FRAGROEUS.

The great botanist PETER KALM did not disdain to write of the fruit and kitchen garden, and several pamphlets were published by him on fruit trees about the year 1757.

Of the works of the nineteenth century the following are probably the most important :—" *Svensk Pomona*," by OLAF ENEROTH (1864-1866), descriptions and plates of fruits, but the drawing and colouring are coarse ; "*Den Danske Frugthave. Et Billedvaerk for Udbredelse af Kjendskab til Landets Frugter udgivet af et Selskab*" (Svendborg, 1869-70-71), 120 plates ; "*Svenska Trädgårdsföreningens Tidskrift*

redigerad af AXEL PIHL och JAKOB ERIKSSON" (1878 and foll.), contains many coloured plates of fruits; "Svenska Fruktsorter i färglagda Afbildningar utgifna af Svenska Trädgårdsföreningen, under redaktion af AXEL PIHL och JAKOB ERIKSSON," Stockholm (1899 and foll.); and "Haandbog i dansk Pomologi, af H. C. BREDSTED," 3 vols., Odense (1890-1896), with descriptions and outline drawings.

APPENDIX.

A SELECTION OF IMPORTANT POMOLOGICAL WORKS.

I. GENERAL POMOLOGIES.

This section includes the more important descriptive works.

1. ENGLISH.

KNIGHT, T. A. "Pomona Herefordiensis." (Cider Fruits.) 1 vol. 4to. col. pls. London, 1811.

BROOKSHAW, G. "Pomona Britannica." 1 vol. atlas folio, 1812.

— "Pomona Britannica." 2 vols. 4to. col. pls. London, 1817.

HOOKE, W. "Pomona Londinensis." vol. 1 (all pub.) fol. col. pl. London, 1818.

LINDLEY, JOHN. "Pomological Magazine, or Pomologia Britannica." 3 vols. roy. 8vo. col. pls. 1828-30.

— GEORGE. "A Guide to the Orchard and Kitchen Garden." 1 vol. large 8vo. London, 1831.

RONALDS, HUGH. "Pyrus Malus Brentfordiensis; or a Concise Description of selected Apples." 1 vol. 4to. pls. London, 1831.

HOGG and BULL. "The Herefordshire Pomona." 2 vols. fol. col. pls. London and Hereford, 1876-1885.

HOGG, ROBERT. "The Apple and its Varieties." 1 vol. 8vo. illus. London, 1851.

— "The Fruit Manual: A Guide to the Fruits and Fruit Trees of Great Britain." 1 vol. 8vo. 1st ed., London, 1860; 2nd ed. 1862; 3rd ed. 1866; 4th ed. 1875; 5th ed. 1884.

SCOTT, JOHN. "The Orchardist, or Catalogue of Fruits Cultivated at Merriott, Somerset." 1 vol. 8vo. 1st ed. 1868, 2nd ed. 1873.

2. AMERICAN.

COXE, WM. "A View of the Cultivation of Fruit Trees and the Management of Orchards and Cider." 1 vol. 8vo. illus. Philadelphia, 1817.

EMMONS, EBENEZER. "The Natural History of New York." Vol. iii. "Fruits." 2 parts, col. pls. Albany, 1851.

DOWNING, A. J. "The Fruits and Fruit Trees of America." 1 vol. roy. 8vo. col. pls. New York, 1845. Revised 1857, 1869. Appendices, 1872-76-81.

THOMAS, JOHN J. "The American Fruit Culturalist." 1 vol. roy. 8vo. illus. New York, 1st ed. 1846, to 21st ed. 1903.

HOVEY, C. M. "The Fruits of America." 2 vols. 8vo. col. pl. Boston, 1852-56.

WARDER, JOHN A. "American Pomology: Apples." 1 vol. cr. 8vo. illus. New York, 1867.

3. FRENCH.

DUHAMEL DU MONCEAU. "Traité des Arbres Fruitières, contenant leur figure, leur description, leur culture, etc." Paris, 2 vols. 4to., 1768.

MIRBEL, POIRET, ET LOISELEUR DES LONGCHAMPS. "Traité des Arbres Fruitières." Nouvelle édition. 150 col. pls. by Redouté and Bessa. 2 vols. folio. Paris (1820?).

J. ST. HILAIRE, MIRBEL, POIRET, ET LOISELEUR DES LONGCHAMPS. "Nouveau Traité des Arbres Fruitières . . ." 2 vols. folio. Paris (1850?).

POITEAU ET TURPIN. "Traité des Arbres Fruitières . . ." 418 col. and 2 plain pls. Paris and Strasbourg, 1807-35. 6 vols. folio.

POITEAU, A. "Pomologie Française. . . ." 4 vols. folio. 433 col. pls. Paris and Strasbourg, 1846.

- NOISETTE, LOUIS. "Le Jardin Fruitier: histoire et culture des arbres fruitiers. . . ." 3 vols. 4to. Paris, 1821. 2nd ed. 2 vols. 8vo. 1839.
- DECAISNE, JOSEPH. "Le Jardin Fruitier du Muséum . . ." 9 vols. 4to. Paris, 1858-75.
- "Pomologie Générale de la France." 8 vols. 8vo. Lyon, 1863-1871.
- DE MORTILLET, P. "Les Meilleurs Fruits par ordre de Maturité et par Série de Mérite." 3 vols. 8vo. Grenoble, 1865-68.
- LEROY, ANDRÉ. "Dictionnaire de Pomologie." 6 vols. 8vo. Paris, 1867-1879.
- MAS, ALPHONSE. "Le Verger . . ." 8 vols. col. pls. Paris (1865-1874?).
- "Pomologie Générale." 12 vols. 4to. Paris, 1872-1883.
- ANON. "Les Meilleurs Fruits au Début du XX^{me} Siècle." 8vo. 1 vol. [1907?].
- "Catalogue descriptif des Fruits adoptés par le Congrès Pomologique." 1 vol. 8vo. Lyon, 1887; Suppl. 1896.
4. GERMAN.
- MAYER, J. "Pomona Franconica." 3 vols. 4to. 253 col. pls. Nürnberg, 1776-1801.
- MANGER, H. L. "Vollständige Anleitung zu einer systematischen Pomologie." 1 vol. folio. Leipzig, 1780.
- KRAFT, JOHANN. "Pomona Austriaca." 2 vols. folio. 200 col. pls. Vienna, 1790-96.
- CHRIST, J. L. "Vollständige Pomologie." 2 vols. 50 col. pls. Frankfurt, 1809-13.
- DIEL, A. F. A. "Versuch einer systematischen Beschreibung . . . Kernobstsorten." 24 vols. 8vo. Frankfurt, 1799-1825.
- BARON VON AEHRENTHAL. "Deutschlands Kernobstsorten." 3 vols. 4to. 98 col. pls. Leitmeritz, 1833-42.
- DITTRICH, J. G. "Systematisches Handbuch der Obstkunde." 2 vols. 8vo. Jena, 1837.
- LANGETHAL, L. E. "Deutsches Obstcabinet in naturgetreuen fein colorirten Abbildungen." 4to. Jena, 1855-6-7-8 (? 1853-60).
- HINKERT, J. W. "Systematisch-geordnetes Handbuch der Pomologie." 3 vols. 8vo. Munich, 1836.
- DOCHNAHL, F. J. "Der sichere Führer in der Obstkunde." 4 vols. 8vo. Nürnberg, 1855-60.
- JAHN, LUCAS, UND OBERDIECK. "Illustriertes Handbuch der Obstkunde." 8 vols. 1859-75, and three extra vols. "Zusätze und Berichtenungen zu Bänder I. und IV." by J. Oberdieck, 1 vol. 8vo. 1868; Supplement "Birnen," Lucas and Oberdieck, Stuttgart, 1879. 1 vol. 8vo.; and Lauche's Erster Ergänzungsband, Berlin, 1883. 1 vol. 8vo.
- LAUCHE, W. "Deutsche Pomologie." 6 vols. 8vo. 300 col. pls. Berlin, 1882-3.
5. BELGIAN.
- BIVORT, A. "Album de Pomologie." 4 vols. folio. Bruxelles, 1847-51.
- BAVAY, L., ROYER, A., AND OTHERS. "Annales de Pomologie Belge et Étrangère." 8 vols. folio. Brussels, 1853-60.
6. ITALIAN.
- GALLESIO, G. "Pomona Italiana." 3 vols. folio. 172 col. pls. Pisa, 1817-39.
- MOLON, G. "Pomologia." 1 vol. 12mo. Milan, 1901.
7. RUSSIAN.
- USSIKOV. "Kratkaya Pomologia." 1 vol. 8vo. Petrograd, 1900.
- SIMIRENKO, LEON. "Pomologie." 1 vol. 8vo. 1901.
- GREBNITZKY. "Atlas Plodov." 4 vols. large 8vo. 100 col. pls. Petrograd, 1903-7.
8. PORTUGUESE.
- OLIVEIRA. "Diccionario das Peras Portuguezas." 8vo. Oporto, 1879.
9. SPANISH.
- PEREZ, JOSÉ. "Pomona de la Provincia de Murcia." 1 vol. 4to. Madrid, 1884.
10. DUTCH.
- KNOOP, J. H. "Pomologia." 2 vols. folio, col. pls. Leeuwarden, 1758.
- VAN NOORT. "Pomologia Batava." 1 vol. Leiden, 1830-40.
- OTTOLANDER AND OTHERS. "Nederlandsche Boomgard." 2 vols. 4to, Boskoop, 1868.

II. SWISS.

ANON. "Schweizerische Obstsorten." 2 vols, oblong folio, col. pls. St. Gallen, 1866, 1872. Vol. i. Apples; vol. ii. Pears.

II. SPECIAL MONOGRAPHS ON VARIOUS HARDY FRUITS.

I. THE APPLE.

- RONALDS. "Pyrus Malus Brentfordiensis." See p. 433.
 HOGG AND BULL. "The Herefordshire Pomona." See p. 435.
 HOGG, R. "The Apple and its Varieties." 1 vol. 8vo. 3 illus. London, 1851. See p. 434.
 ENGELBRECHT, TH. "Deutschlands Apfelsorten." See p. 426.
 BARRON, A. F. "British Apples." Report of the Committee of the National Apple Congress. 5 pls. 8vo. London, 1884.
 BEACH, S. A. "The Apples of New York." 2 vols. 8vo., col. pls. Albany, 1905. See p. 438.
 RAGAN, W. H. "Nomenclature of the Apple." Washington, 1905.
 ANON. "Unsere besten Deutschen Obstsorten." Vol. i. "Apples." 4to. 41 col. pls. Wiesbaden (1914?).

2. THE APRICOT.

- THOMPSON, R. "Apricot. A report upon the Varieties of the, cultivated in the Gardens of the Horticultural Society." See R.H.S. Transactions, Series II. vol. i. p. 56-74.
 LAUCHE, W. "Deutsche Pomologie." See p. 426.
 MAS, A. "Le Verger." See p. 430.

3. BUSH FRUITS.

- DOCHNAHL, F. J. "Der sichere Führer in der Obstkunde," vol. iv. 1860. See p. 425.
 PUCCI, A. "Frutti Minori, Fragole, Poponi, Ribes, Uva spina, e Lamponi." 18mo. 96 figs. Milano, 1895.
 LEBL, M. "Anzucht und Kultur der Johannisbeere, Stachelbeere, Himbeere &c. . . und der Bereitung der Beerenweine." Illus. No date. (Modern.)
 VERCIER, J. "Le Cassis, son Histoire, sa Culture, etc." Brochure, 76 pp. 12 figs. (Modern.)
 CARD, F. W. "Bush-Fruits A Horticultural Monograph of Raspberries, Blackberries, Dewberries, Currants, Gooseberries, and other shrub-like Fruits." New York, 1907 (4th ed.). 1 vol. 8vo. Many illus.
 JUNGE, E. "Unser Beerenobst in Feld und Garten." Roy. 8vo. 27 col. pls. 66 figs. Wiesbaden (1913?).

4. THE CHERRY.

- TRUCHSESS, C. F. "Systematische Classification und Beschreibung der Kirschensorten." 1 vol. 8vo. Stuttgart, 1819.
 THOMPSON, R. "A Report upon the principal Varieties of the Cherry cultivated in the Gardens of the Society." H.S. Transactions, Series II. vol. i. pp. 248-294.
 DE MORTILLET. "Les Meilleurs Fruits." Vol. ii. See p. 428.

5. THE FIG.

- GALLESEO, G. "Pomona Italiana. Parte scientifica." First fascicle on the Fig. 1 vol. 8vo. Pisa, 1820.
 EISEN, G. "The Fig, its History, Culture, and Curing, with a Descriptive Catalogue of the Known Varieties of Fig." Washington, 1901.
 RAVASINI, R. "Die Feigenbäume Italiens und ihre Beziehungen zu einander." 1 table, 61 illus. Bern, 1911. (Historical, caprification, and marketing.)

6. THE MULBERRY.

- PANIAGNA, D. JOSÉ. "Del Cultivo especial de la Morera y de sus Variedades," 8vo. Logroño, 1841.

SERINGE, N. C. "Description, Culture, et Taille des Mûriers, leurs espèces et leurs variétés." 2 vols. 8vo. Paris, 1855.

GUILLAUD, EUGÈNE. "L'Olivier et le Mûrier. Histoire, Culture, Parasites." 8vo. Paris, 1899.

7. NUTS—COBNUITS AND FILBERTS (*Corylus Avellana*).

DOCHNAHL, F. J. "Der sichere Führer in der Obstkunde," vol. iv. 1860. See p. 425.

GOESCHKE, FRANZ. "Die Haselnuss, ihre Arten und ihre Kultur." 1 vol. 4to. Berlin, 1887. 76 plain pls.

"Deutsches Obstkabinet." See p. 425.

8. NUTS, WALNUTS.

HENRY, L., AND GIFFEY, C. "Le Noyer." Brochure, 18mo. Modern.
FALLOT, B. "Le Noyer et ses Produits, Noix, Huile, Torteaux." Paris, 1 vol. 8vo. (1900 ?)

SMITH, R. E. "Walnut Culture in California." University of California Bull. No. 231. 1 vol. 8vo. 1912.

LAKE, E. R. "The Persian Walnut Industry of the United States." U.S. Dept. Agriculture Bull. No. 250. Washington, 1913.

(This and the work of R. E. Smith contain good descriptions and photographs of the different varieties of walnuts, both European and American.)

9. THE PEACH.

LINDLEY, G. "A Classification of Peaches and Nectarines." H.S. Transactions, vol. v. pp. 525-560.

CARRIÈRE, E. A. "Description et Classification des Variétés de Pêchers et de Brugnonniers." 1 vol. 8vo. Paris. (No date; about 1885 ?)

STOLL, R. "Die Amerikanischen Frühpflirsiche, mit Berücksichtigung der Frühpflirsiche überhaupt." 1 vol. 8vo. 14 col. pls. Klosterneuberg, 1889 (Good plates and descriptions of the American early peaches.)

10. THE PEAR.

CRAIG, J. "Oriental Pears (*Pyrus sinensis*) and their Hybrids." Cornell University Bull. No. 332.

DECAISNE, J. "Le Jardin Fruitier." See p. 428.

DU MORTIER, J. B. C. "Pomone Tournaisienne." 1 vol. 8vo. Tournay, 1869. (History of Belgian Pears and their raisers.)

GILBERT, CH. "Les Fruits Belges" (in Journal of the Royal Linnean Society of Belgium), 1874. (Largely occupied with Belgian pears.)

BARRON, A. F. "Report of the Committee of the National Pear Conference," R.H.S. Journal, vol. ix. 1887.

RAGAN, W. H. "Nomenclature of the Pear. A Catalogue Index of the known Varieties referred to in American publications from 1804 to 1907." 1 vol. 8vo. Washington, 1908.

11. THE PLUM.

GUENDERRODE UND BORKHAUSEN. "Die Pflaumen." 8vo. Darmstadt, 1804-08. (Describes 36 plums, with col. pls.)

LIEGEL, G. "Systematische Anleitung zur Kenntniss der Pflaumen." 2 vols. 1838-44.

BAILEY, L. H. "Reports upon Japanese Plums." Cornell University Reports, Bull. Nos. 13, 62, 106, and 175.

WAUGH, W. "Plums and Plum Culture. A Monograph of the Plums cultivated and indigenous in North America." 8vo. New York, 1910.

HEDRICK, U. P. "The Plums of New York." 1 vol. 4to. col. pls. Albany, 1911. See p. 438.

12. THE STRAWBERRY.

DUCHESNE FILS. "Histoire Naturelle des Fraisiers." 8vo. Paris, 1766.

BARNET, JAMES. "An Account and Description of the different Varieties of Strawberries which have been cultivated and examined in the Garden of the Horticultural Society." H.S. Transactions, vol. vi. 1824.

VILMORIN, MADAME ELISA. "Le Jardin Fruitier du Muséum." 1857.

LAMBERTYE, COMTE LÉONCE DE. "Le Fraisier, sa Botanique, son Histoire sa Culture." 8vo. Paris, 1863.

GLOEDE, FERDINAND. "Les Bonnes Fraises." 12mo. Paris, 1865.

REGEL, DR. E. "Die Himbeere und Erdbeere." 1866.

GOESCHKE, FRANZ. "Das Buch der Erdbeeren." 8vo. Berlin, 1874.

MILLET, A. "Le Fraisiers." 8vo. Paris, 1898.

LAXTON, BROTHERS. "The Strawberry Manual." (No date; recent.)

13. THE VINE.

BARRON, A. F. "Vines and Vine Culture, being a Treatise on the Cultivation of the Grape-vine, with Descriptions of the principal Varieties." 8vo. illus. London, 1883.

HEDRICK, U. P. "The Grapes of New York." 1 vol. 4to. col. pls. Albany, 1908. See p. 438.

14. GENERAL CATALOGUES AND REFERENCE WORKS.

"Catalogue of Fruits cultivated in the Garden of the Horticultural Society." 8vo. London, 1826. 2nd ed. 1831; 3rd ed. 1842; suppl. 1853.

"Catalogo Speciale della Collezione di Alberi fruttiferi della Società Toscana d'Orticoltura." 8vo. 1862.

SIMON-LOUIS FRÈRES. "Guide Pratique de l'Amateur de Fruits." 8vo. Paris, 1876. See p. 430.

MATHIEU, CARL. "Nomenclator Pomologicus." 8vo. Berlin, 1889. See p. 427.

BUNYARD, E. A. "An Index to Illustrations of Apples." Journal of the Royal Horticultural Society, vol. xxxvii. pp. 152-174. (References to coloured plates of the principal pomologies.)

BUNYARD, E. A. "An Index to Illustrations of Pears." Journal R.H.S., vol. xxxvii. pp. 321-349.

15. GRAFTING AND BUDDING.

WARDLE, WILLIAM. "The Scientific and Profitable Culture of Fruit Trees, including choice of Trees, Planting, Grafting, Training, Restoration of unfruitful Trees, &c." Illustrated. From the French of M. Du Breuil, adapted by William Wardle. 8vo. London, 1862. 2nd ed. 1872; 5th ed. (recent) revised by George Glenny, 8vo.

BALTET, CHARLES. "The Art of Grafting and Budding." Translated from the French of Charles Baltet. 8vo. London, 1873. 5th ed. London, 1903.

THOUIN, A. "Monographie des Greffes, ou Description technique des diverses sortes de Greffes employées pour la Multiplication des Végétaux." 8vo. Paris, ca. 1821.

BALTET, CHARLES. "L'Art de Greffer." 8vo. Paris, 1869. Recent editions in 1892 and 1898.

NOISETTE, LOUIS. "Traité Complet de la Greffe (suivi de l'essai sur la greffe (l'herbe, des plantes et des arbres, par le Baron Tschudy)." 12mo. Paris, 1852. 2nd ed.)

CARRIÈRE, E. A. "Guide Pratique du Jardinier multiplicateur, ou Art de propager les Végétaux par semis, boutures, greffes, etc." 12mo. Paris, 1856.

MOTTET, S. "Guide Élémentaire de Multiplication des Végétaux." 12mo. Paris, 1895.

16. PRUNING AND TRAINING.

FORNEY, E. "La Taille des Arbres fruitiers." 2 vols. 18mo. 680 pages, 349 figs. Paris, 1889.

LUCAS, EDWARD. "Die Lehre vom Baumschnitt." 4 tables, 256 illustrations. 8th ed. Stuttgart, 1909.

VERCIER, J. "L'Arboriculture fruitière en images." 1 vol. 8vo. 101 plates. Paris. (No date; recent.)

UDALE, J. "Handy Book of Pruning." 8vo. Evesham, 1909. Illustrated.

ANON. "Pruning: a Series of Articles for Commercial Fruit-growers." (Lockwood Press.) London (1912?).

17. CULTURE UNDER GLASS.

RIVERS, THOMAS. "The Orchard House; or the Cultivation of Fruit Trees under Glass." 8vo. 1 vol. 1851, and numerous later editions.

THOMSON, D. "Handy Book of Fruit Culture under Glass." 1 vol. 8vo. Edinburgh and London, 1873. (Treats of Pine-apples, Vines, Peaches, Nectarines, Figs, &c.)

PYNAERT, ED. "Les Serres Vergers." 1 vol. 8vo. 134 figs. and 3 plates. (4th edition.) Gand, 1888.

LECOLIER, P. "Culture Rationnelle des Arbres fruitiers en Pots." Brochure. illus. (Modern.)

BRACE, J. "The Culture of Fruit Trees in Pots." 8vo. illus. London, 1904.

18. FRUIT FARMING.

BUNYARD, GEORGE. "Fruit Farming for Profit." 1 vol. 8vo. illus.

GOETHE, R. "Deutscher Obstbau." 1 vol. 8vo. illus. Berlin, 1909.

HOOPER, C. H., AND OTHERS. "Fruit Farming, Practical and Scientific." 1 vol. 8vo. illus. London, 1913.

DURAND, E. "La Culture fruitière moderne: Production, Commerce, et Utilisation des Fruits." 1 vol. 16mo. 28 figs. (Modern.)

WAUGH, F. A. "The American Apple Orchard." 1 vol. 8vo. Illus. New York, 1908.

SEARS, F. C. "Productive Orcharding." 1 vol. 8vo. illus. Philadelphia, 1914.

PASSY, PIERRE. "Traité d'Arboriculture fruitière." 3 vols. illus. 300 figs.

19. GENERAL CULTURAL WORKS

BUNYARD, GEORGE, AND THOMAS, OWEN. "The Fruit Garden." 1 vol. 8vo. London, 1904.

SANDERS, T. W. "Fruit and its Cultivation." 1 vol. 8vo. London, 1913.

GAUCHER, N. "Handbuch der Obstkultur." See p. 426.

— "Obstbaukunde." 1 vol. Berlin, 1912.

WRIGHT, J. "The Fruit Grower's Guide." 3 vols. 4to. 46 col. pls. London, 1892.

WRIGHT, W. P. "Pictorial Practical Fruit Growing." 8vo. London, 1903.

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